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IN THE APPLICATION
OF
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FOR AN
DIAPER WITH LEGS

DIAPER WITH LEGS

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates to disposable diapers, and
5 more particularly to a diaper with legs. The diaper may have
reclosable fasteners about the waist and legs, or may be of the
pull-on type without fasteners.

2. DESCRIPTION OF THE RELATED ART

Absorbent articles for the lower torso, such as diapers,
10 pull-on diapers and pull-on pants, are used to capture waste
matter for infants and those who cannot control their bodily
functions. Absorbent articles have made life cleaner and easier
for those who wear the articles and their caregivers. These
absorbent articles, however, are not entirely problem free.
15 There are times when body exudates seep through the openings of
the absorbent article, such as at the leg openings and the waist
opening. A diaper is therefore desired that can contain waste
matter that may leak out the openings of the diaper.

A number of pant-like absorbent articles have been
developed to aid in retaining waste matter excreted by the body.

U.S. Patent Publication Number 2002/0165518, published on November 7, 2002, describes a pant-like, prefastened, disposable absorbent article that reduces leakage when worn as pants rather than a diaper. In one embodiment, the absorbent article has a pair of elastic leg members that are adapted to fit about the legs of a wearer. The leg members maintain contact with the legs and reduce or eliminate leaks. The absorbent article has an absorbent core with a pocket defined therein to receive and retain body exudates. Additionally, the absorbent article may have a containment flap disposed near the pocket to provide a barrier to the lateral flow of body excretions.

U.S. Patent Publication Number 2003/0181883, published on September 25, 2003, describes a garment-like absorbent article. The article is a pant-like article that functions like underwear. The article has a pair of leg openings. The length of the outer cover of the article, measured from the front waist edge to the rear waist edge can be shorter than other bulkier garments so the article can be worn without being visible over the waistline of lower torso garments.

U.S. Patent Number 5,916,206, issued to Ostubo et al. on June 29, 1999, describes an absorbent pant-like undergarment that utilizes elastic elements to prevent leaks. The pants-type

undergarment has a pair of leg openings to configure the garment into pants or a brief-like shape. U.S. Patent Number 6,210,386, issued to Inoue on April 3, 2001, describes a disposable pull-on, pant-type undergarment having elastic auxiliary flaps to secure the garment to the waist and aid in disposal of the garment. U.S. Patent Number 6,328,724, issued to Ronnberg et al. on December 11, 2001, describes an absorbent article having longitudinal side flaps for retaining liquid within the absorbent article.

U.S. Patent Number 6,482,196, issued to Hisada on November 19, 2002, describes disposable undergarment pants combined with a belly protector. The undergarment has a front body joined to a rear body to define both a tubular waist configuration at the top of the undergarment and leg openings at the bottom of the undergarment. Elastic is integrated into both the belly protector and the pants section of the undergarment.

U.S. Patent Publication Number 2003/0199841, published on October 23, 2003 to Ashton et al., describes an absorbent article having article retention zones dependent on static friction. One embodiment shows a pant-like absorbent article. Japanese Patent Number 2003-210518, published on July 29, 2003, shows a disposable pant-type diaper having legs. Japanese

Patent Number 2003-38554, published on February 5, 2003, shows a pant-type disposable diaper having a penis-receiving zone.

Some absorbent articles have been developed that utilize leg cuffs. U.S. Patent Publication Number 2003/0208171, published on November 6, 2003, describes an absorbent article with self-forming seals. The article fits like pants having seals at natural body hinge points of a wearer and in-captured elastic leg cuffs. The leg cuffs extend from the absorbent core of the diaper article and provide targeted stretch and recovery as the leg moves.

U.S. Patent Publication Number 2003/0158532, published on August 21, 2003, describes a disposable absorbent article for the lower body. The article may have barrier cuffs or gasketing leg cuffs disposed on a portion of the article that faces the body. The cuffs may help in preventing leaks. U.S. Patent Publication Number 2004/0002690, published on January 1, 2004, describes a disposable absorbent article having elasticized outer leg cuffs. The gasket cuff contains a sleeve that holds elastic material to provide a seal with the leg.

U.S. Patent Number 6,156,024, issued to Schulte et al. on December 5, 2000, describes an absorbent article having lotioned leg cuffs. Japanese Patent Number 2003-88262, published on

March 25, 2003, describes a pet diaper. Japanese Patent Number 11-290377, published on October 26, 1999, shows a pants-shaped disposable diaper having elastic members on a front panel and a back panel. Japanese Patent Number 2003-199778, published on July 15, 2003, shows a diaper cover having a pocket for holding a urine-taking pad.

Absorbent articles utilizing a number of absorbent core components are described in U.S. Patent Publication Number 2003/0199844, published on October 23, 2003 (disposable absorbent article for a lower body, having pockets to store multiple replaceable absorbent core components) and U.S. Patent Publication Number 2003/0225385, published on December 4, 2003 (an absorbent article having longitudinally arranged multiple core components).

Some absorbent articles have been developed that utilize fastener elements to retain the absorbent article on a wearer. U.S. Patent Publication Number 2004/0002691, published on January 1, 2004, describes absorbent pants having an optimized leg opening shape designed to transfer stress away from a fastener element and minimize the possibility of the fastener disengaging.

U.S. Patent Number 4,936,840, issued to Proxmire on June 26, 1990, describes a method of reducing waist droop in a disposable diaper. The diaper has landing zones on a front panel and ear fasteners on a back panel. The method requires the landing zones to be oriented on the front panel so tensile stresses are distributed away from leg openings and a waist opening. U.S. Patent Publication Number 2003/0220626, published on November 27, 2003, describes an absorbent article that does not require a loop fastener as seen in hook and loop type fasteners.

Still other absorbent articles have been described in U.S. Patent Number 6,520,944, issued to Jonbrink on February 18, 2003 (a diaper); U.S. Patent Publication Number 2003/0229327, published on December 11, 2003 (absorbent pants having high leg cuts); U.S. Patent Publication Number 2003/0164136, published on September 4, 2003 (a wearing article having a wetness indicator); U.S. Patent Publication Number 2003/0149412, published on August 7, 2003 (diaper having permanent leg openings); and U.S. Patent Publication Number 2003/0212378, published on November 13, 2003 (a refastenable absorbent garment having elastic members at a waist opening and leg openings to enhance containment and absorption of body exudates).

None of the above inventions and patents, taken either singly or in combination, is seen to describe the instant invention as claimed. Thus a diaper with legs solving the aforementioned problems is desired.

SUMMARY OF THE INVENTION

The diaper with legs of the present invention is a lower torso garment worn by a user to retain excreted waste matter. The diaper may have fasteners to close the waist and legs, or may be of the pull-on type. The diaper includes a flat sheet wrapped around the torso with legs extending from the sides of the sheet. A front waist arch and a rear waist arch are disposed at an upper portion of the edges of the sheet. The arches extend the height of the diaper in front and back. An elastic material is disposed at the waist arches, at the junction between the legs and the central portion of the diaper, and at the end of the legs. The elastic material disposed at the end of the legs and at the junction between the legs and the central portion provide double leak protection at the legs.

These and other features of the present invention will become readily apparent upon consideration of the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an environmental, perspective view of a diaper with legs according to the present invention.

Fig. 2 is a plan view of the diaper with legs according to the present invention in an unfolded state.

Fig. 3 is a front perspective view of an alternative embodiment of the diaper with legs of the pull-on type.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is a diaper with legs, designated generally as 20 in Figs. 1 and 2. The diaper 20 is shown in Fig. 1 in a fastened, closed configuration. The diaper 20 has a central portion 30 and legs 40. The central portion 30 has an upper portion and a lower portion that covers a user's waist and crotch. The lower region of the central portion 30 defines a pair of upper thigh openings. The upper region of the central portion 30 defines a waist opening 31. Specifically, a front waist arch 70 and a rear waist arch 72 extend from the upper region of the central portion 30 and define the waist opening 31. The arches 70, 72 elevate the waist opening 31 so the upper

region of the diaper 20 covers a larger area on the user's waist.

The legs 40 downwardly depend from the pair of upper thigh openings disposed at the lower region of the central portion 30.

5 The legs 40 have a top end and a bottom end 50. The top end of the leg sleeve 40 is attached to the central portion by elastic material 60. The bottom end 50 defines leg openings 41 that terminate on the thigh of the user's leg, preferably at about the mid to lower thigh.

10 The diaper 20 uses elastic material or any other resilient material to provide tight seals and conform to the user's body. For example, elastic material 60, disposed between the legs 40 and the central portion 30, forms a tight seal on the upper thigh of the user. Likewise, the bottom ends 50 of the legs 40
15 utilize elastic material 60 to form a tight fit on the user's mid to lower thigh.

Waste matter excreted by the user is retained within the diaper 20 due to the seal formed at the user's upper thighs by the elastic material 60. If, however, waste matter leaks past
20 the elastic material 60, then the seal provided at the bottom end 50 of the leg sleeves 40 should contain the waste in the leg sleeves 40 and prevent waste matter from leaking out the leg

openings 41. Here, the elastic material 60 and the elastic incorporated at the bottom end 50 of the leg sleeves 40 provide double protection from waste matter leaking out the leg openings 41.

5 The diaper 20 is maintained in the fastened, closed configuration by fastening members 32, 42. Fastening members 32 are disposed on the central portion 30 and fastening members 42 are disposed on the legs 40. The fastening members 32, 42 may be a narrow tab or a wide flap, which covers more area on the
10 diaper 20 than the tab. At least one pair of both fasteners 32 and fasteners 42 are disposed on the diaper 20 to fasten the diaper 20 and hold it in the closed configuration. Fastener members 32, 42 are made from any reclosable fastening material.

 The diaper 20 has an exterior surface and an interior
15 surface. In the closed configuration, the interior surface 24 is dimensioned and configured to contact the user's body, crotch and legs while the exterior surface is designed to contact clothing worn by the user. The exterior surface 22 comprises non-absorbent material and is impermeable to liquids. The
20 interior surface 24 of the diaper 20 comprises preferably two absorbent materials. The materials are two layers of absorbent liners that are disposed one on top of the other. The absorbent

material gives the diaper 20 a maximum thickness of about one-half inch.

Referring now to Fig. 2, the diaper 20 is shown in an open configuration, comprising a sheet with the interior surface 24 of the diaper 20 facing upward. The central portion 30 includes a front waist panel 36, a crotch region 37 and a rear waist panel 38 forming a generally hourglass shape.

The front waist arch 70 is formed integrally with the front waist panel 36 and the rear waist arch 72 is formed integrally with the rear waist panel 38. The arches 70, 72 incorporate elastic material (e.g., gathers) 64, 66, respectively, at upper edges of the arches. Like the elastic material 60 disposed between the legs 40 and the central portion 30 and the elastic gathers incorporated at the bottom ends 50 of the legs 40, the elastic material 64, 66 disposed at the upper edges of the arches 70, 72, provides protection from leaks that otherwise would seep up the waist panels 36, 38 and out the waist opening 31.

Waist panels 36, 38, form the wide part of the diaper 20 and the crotch region 37 disposed between the waist panels 36, 38 defines the narrow part of the diaper 20. Fasteners 32 are disposed at the ends of the widest part of the rear waist panel

38. As shown in Fig. 1, the fasteners 32 hold the central portion 30 together in the closed configuration. The crotch region 37 is dimensioned and configured to cover the genitalia of the user. The crotch 37 defines the upper thigh openings of the diaper 20 and is bordered by elastic material 60. Elastic material 60 attaches the legs 40 to the central portion 30 of the diaper 20.

In the open configuration, the legs 40 have a generally rectangular panel shape defined by a rear edge 48, a front edge 46, an inner edge 52 and a bottom end 50. Fasteners 42 are disposed at the rear side 48 of the legs 40 to be refastenably affixable to the front side 46 when the legs 40 are configured around the user's legs. About a central, one-third portion of the length of the top edge 52 of each leg 40 is attached to the central portion 30 by the elastic material 60.

As mentioned above, the interior surface 24 of the diaper 20 is composed of absorbent material. In the central portion 30, the absorbent material is longitudinally arranged at the crotch region 37 to form an absorbent core 54. In the legs 40, the absorbent material is disposed within the generally rectangular panel of legs 40 between the rear edge 48, the front edge 46, the inner edge 52 and the bottom end 50.

In use, a caregiver aligns the user over the interior surface 24 of the open diaper 20 so that the user's back rests on the rear waist panel 38, the user's genitalia align with the crotch region 37, and the user's legs lie in the center of the leg sleeves 40. The diaper 20 is then folded at the crotch region 37 so the front waist panel 36 lies on the user's waist. The fastening members 32, disposed on the rear waist panel 38 can then be attached to the front waist panel 36 to hold the diaper 20 in a closed configuration.

In order to hold the waist panels 36, 38 to the user's body both panels 36, 38 must be stretched around the user's waist sides so that the fastening members 32 can be fixed to the front waist panel 36. By stretching the panels 36, 38, the elastic materials 64, 66 disposed within the arches 70, 72 are extended and the arches 70, 72 are held taut against the user's body. The arches 70, 72, therefore, create a close fit at the waist opening 31 of the diaper 20 to provide protection against waste matter leaking out of the waist opening 31.

To form the legs 40 and define the leg openings 41, the front edge 46 and the rear edge 48 are brought together and wrapped around the user's leg. Fastening member 42, disposed on the rear edge 48, stretches over and attaches to the front edge

46 forming the legs 40 and the leg openings 41. The top edges 52 of the legs 40 are free to encircle the user's legs, since only the central one-third portion of the top edges 52 are attached to the crotch 37 of the central portion 30.

5 An alternative embodiment to the diaper 20 is a disposable pull-up diaper 200 shown in Fig. 3. The diaper 200 comprises a flexible, absorbent fabric having a central portion 300 having a front, a back, an upper portion defining a waist opening 310 and a lower portion to which a pair of legs 400 are attached. A
10 front waist arch 700 and a rear waist arch 720 are disposed at the upper portion of the diaper 200, further defining the waist opening 310 and extending the coverage of the diaper 200 upward on the waist of the user. Elastic material 640 is incorporated at upper edges of the arches 700, 720 and encircles the waist of
15 the user. The elastic material 640 forms a seal to the user's upper torso to prevent waste matter from seeping up and out the waist opening 310.

Legs 400 have a top end and a bottom end 500. The top end of the legs 400 is fixed to the lower region of the central
20 portion 300 with elastic material 600. The bottom end 500 of the legs 400 terminate at the mid to lower thigh of the user. The legs 400 define leg openings 410. The elastic material 600

disposed between leg sleeves 400 and the central portion 300 and the elastic gather incorporated at the bottom end 500 of the legs 400 provide double leak protection against waste matter seeping down the user's leg at the leg openings 410. The diaper 200, like diaper 20, has an absorbent interior surface 240 and a non-absorbent exterior surface 220. The interior surface 240 of the diaper 200, specifically, the central portion 300 and the legs 400, preferably comprises two absorbent materials that are disposed on top of each other in layers.

It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.